Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-18. (Cancelled)

19-20. (Cancelled)

21. (Currently Amended) A refrigerator according to claim ~~20~~41, wherein the controller determines the load by estimating an enthalpy of the food items in the cooling chamber.

22. (Currently Amended) A refrigerator according to claim ~~19~~41, wherein the controller adjusts the cooling capacity by adjusting at least one of the speed and run time of the compressor.

23. (Currently Amended) A method for controlling a cooling capacity of a compressor in a refrigerator having a cooling compartment, comprising:

controlling the operation of the compressor to maintain the temperature within the cooling chamber at a set temperature;

determining a variation in the temperature of the cooling compartment in response to an increased ~~enthalpy~~ load due to the addition of at least one warm food item in the cooling compartment; and

~~adjusting~~ increasing the cooling capacity of the compressor in response to the determined variation in the temperature to reduce the temperature in the cooling chamber below the set temperature an amount to compensate for the load of the at least one warm food item. ~~increase the rate of cooling as compared to a rate of cooling without an increase in enthalpy.~~

24. (Previously Presented) A method according to claim 23 wherein the adjusting of the cooling capacity is in proportion to the determined temperature variation.

25. (Previously Presented) A method according to claim 24 wherein the determined temperature variation comprises comparing a sensed temperature of the cooling compartment to a reference temperature.

26. (Currently Amended) A method according claim ~~21~~23, wherein the increased enthalpy is attributable to the placement of a food item inside the refrigerator.

27. (Currently Amended) A method according to claim ~~21~~23, wherein the adjusting the cooling capacity comprises analyzing a shape factor of the determined temperature variation, wherein such shape factor is selected from the group consisting of derivatives, area, peak, overshoot duration, and power spectrum.

28. (Previously Presented) A method according to claim 27, wherein the adjusting of the cooling capacity further comprises estimating the enthalpy of the food from an analysis of at least one of the shape factors.

29. (Currently Amended) A method according to claim 28, wherein adjusting the cooling capacity comprises adjusting at least one of the speed and run time of the compressor so that at least one of the integral and the peak of the determined temperation variation is below a reference temperature.

30. (Previously Presented) A method according to claim 29 wherein the reference temperature is an average temperature.

31. (Previously Presented) A method according to claim 28 wherein the adjusting of the cooling capacity is proportional to the estimated enthalpy.

32. (Previously Presented) A method according to claim 27, wherein the determining the temperature variation comprises sensing the temperature in the cooling compartment and comparing the sensed temperature to a reference value.

33. (Previously Presented) A method according to claim 32, wherein the comparison determines when the sensed temperature is above the reference value.

34. (Previously Presented) A method according to claim 33, and further comprising estimating an enthalpy of a food item placed in the refrigerator from at least the overshoot shape of the sensed temperature, and increasing the cooling capacity of the variable capacity compressor so that at least one of an integral and a peak of the temperature variation below the reference value is proportional to the estimated enthalpy.

35. (Previously Presented) A method according to claim 33, and further comprising processing shape factors such as areas and derivatives of the temperature sensor output signals using soft computing techniques such as fuzzy logic and neural networks to provide an estimated enthalpy of a food item and to adapt the compressor response thereto.

36. (Previously Presented) A method according to claim 33, and further comprising switching the compressor to one of on and off when a temperature inside the refrigerator reaches one of a nominal cut-on temperature and cut-off temperature, respectively, so that that such cut-on temperature and cut-off temperature are adjusted according to an estimated enthalpy and are progressively readjusted to the nominal values in order to provide an energy efficient cooling.

37. (Previously Presented) A method according to claim 33, and further comprising determining an integral of the temperature variation above the reference value, and increasing the cooling capacity of the variable capacity compressor so that at least one of the integral and a peak value of the temperature variation is proportional to the integral.

38. (Previously Presented) A method according to claim 33, and further comprising determining a derivative of a decrease in the sensed temperature below the reference value and increasing the cooling capacity of the variable capacity compressor so that at least one of the derivative and the peak of the temperature variation is inversely proportional to the estimated derivative.

39. (Previously Presented) A method according to claim 23, and further comprising adjusting the cooling capacity of the compressor pursuant to the application of a control algorithm based on a proportional-derivative-integral technique according to the formula

$$u(t) = Kp * [e(t) + \frac{1}{Ti} * \int_0^t e(t)\,dt + Td * \frac{de(t)}{dt}]$$

wherein

$u(t)$ = compressor cooling capacity request;

Kp = preselected coefficient,

$e(t)$ = temperature error = $T_{probe} - T_{target}$,

Ti = integral time,

Td = derivative time,

T_{target} = temperature reference depending on user set temperature.

40. (Previously Presented) A method according to claim 39, and further comprising adjusting the parameters *Ti*, *Td*, and *Kp* according to one of opening the refrigerator door and detecting a sudden rise in temperature in order to speed up a cooling time.

41. (New) A refrigerator comprising:

a cooling chamber for cooling a food item placed therein;

a compressor having an adjustable cooling capacity;

a temperature sensor providing a signal representative of the temperature of the cooling chamber; and

a controller operably coupled to the compressor and temperature sensor to receive the signal over time from the temperature sensor such that the controller controls the operation of the compressor to maintain the temperature within the cooling chamber at a set temperature, and determines an increase in the temperature of the cooling chamber indicative of the addition of a warm food item into the cooling chamber, where the controller increases the cooling capacity of the compressor to reduce the temperature in the cooling chamber below the set temperature an amount to compensate for the load of the warm food item.